

REMARKS

Reconsideration of the above-identified application in view of the foregoing amendments and following remarks is respectfully requested.

A. Claim Status / Explanation of Amendments

Claims 1-19 are pending and were rejected. As to the merits, claims 1 and 3 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by European Patent No. EP 1,031,726 A2 to Kato, et al. ("Kato"). [5/17/07 Office Action, p. 2]. Claims 8-11 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kato. [5/17/07 Office Action, p. 3]. Claims 2, 4-6, 12-13, and 16-19 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kato in view of U.S. Patent No. 5,356,971 to Sagawa, et al. ("Sagawa"). [5/17/07 Office Action, p. 3]. Claims 6, 7, 14, and 15 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kato and Sagawa in view of CN1227241 A ("CN1227241"). [5/17/07 Office Action, p. 4].

By this paper, claims 1-4 and 6-7 are amended and claims 12-19 are canceled without prejudice or disclaimer. Applicants reserve the right to pursue canceled claims in a continuing application. Claim 1 is amended to include the constituents of the binder resin, solid lubricant, inorganic particles, and coupling agent which comprise the sliding film. More specifically, claim 1 is amended to recite, *inter alia*, a sliding film "made of a binder resin which is polyimide or polyamide-imide, polytetrafluoroethylene acting as a solid lubricant, titanium oxide powder, and a silane coupling agent." Claim 1 is further amended to recite, *inter alia*, that the content by mass of "the polytetrafluoroethylene relative to the binder resin is in the range between 15% by mass and 100% by mass, inclusive, the content of the titanium oxide powder relative to the

binder resin is in the range between 5% by mass and 35% by mass, inclusive, and the content of the silane coupling agent relative to the binder resin is in the range between 2% by mass and 8% by mass, inclusive." Support for the changes to claim 1 can be found throughout the application as originally filed including, for example, original claim 3 and p. 7, lns. 22-29 for the binder resin; p. 7, lns. 31-34 and p. 8, ln. 34 to p. 9, ln. 10 for the solid lubricant; original claims 4 and 6, p. 8 lns. 2-32, and p. 9, ln. 11-21 for the inorganic particles; and original claim 2 as well as p. 9, ln. 23 to p. 10, ln. 3 for the coupling agent.

Claims 2-4 are amended to further limit the composition of the sliding film with claim 3 being amended to depend from claim 2 instead of claim 1 and claim 4 being amended to depend from claim 3 instead of claim 1. Claim 2 is amended to recite the polytetrafluoroethylene, titanium oxide, and silane concentrations disclosed in sliding films C8-C19 and C31-C36 as listed in Tables 1, 2, and 4. Claims 3 and 4 are further amended to recite titanium oxide (claim 3) and polytetrafluoroethylene (claim 4) contents of 15.4 to 30.8% and 30.1 to 76.0% by mass, respectively. The titanium oxide content in claim 3 is derived from sliding films C9-C19 and C31-C36 whereas the polytetra fluoroethylene content in claim 4 is derived from sliding films C9, C11-C19, and C31-C36 as disclosed in Tables 1, 2, and 4.

Claim 7 is amended to depend from claim 6 instead of claim 4 and claim 6 is amended to depend from claim 1 instead of claim 4. Claim 6 is further amended to recite the concentration of polytetrafluoroethylene instead of titanium oxide powder, with the content of polytetrafluoroethylene relative to the binder resin being "in the range between 30.0% by mass and 80.0% by mass." Support for the changes to claim 6 can be found throughout the application as originally filed including, for example, Tables 1-4 and accompanying descriptive text.

No new matter will be introduced into this application by entry of these amendments.
Entry is respectfully requested.

B. Claims 1 and 3 are Not Anticipated by Kato

Applicants respectfully traverse the rejection of claims 1 and 3. As set forth in detail below, Kato does not teach, disclose, or suggest each and every element of these claims. Accordingly, the Section 102 rejection is respectfully traversed.

Applicants' claim 1, as amended, recites:

1. A compressor, comprising:
a first member having a first sliding surface; and
a second member having a second sliding surface,
wherein one of the sliding surfaces slides on the other sliding surface, and
wherein a sliding film is formed on at least one of the first sliding surface and the second sliding surface, the sliding film being made of a binder resin which is polyimide or polyamide-imide, polytetrafluoroethylene acting as a solid lubricant, titanium oxide powder, and a silane coupling agent, and
wherein, in the sliding film, the content of the polytetrafluoroethylene relative to the binder resin is in the range between 15% by mass and 100% by mass, inclusive, the content of the titanium oxide powder relative to the binder resin is in the range between 5% by mass and 35% by mass, inclusive, and the content of the silane coupling agent relative to the binder resin is in the range between 2% by mass and 8% by mass, inclusive.

Kato is directed to a compressor piston coated with a thin film exhibiting improved wear resistance. In one aspect, Kato discloses a piston coated with a layer comprising a binder, a fluorocarbon resin, and a wear-resistant additive such as calcium fluoride. [Kato, ¶6 and ¶13]. The Office Action contends that Kato's coating layer corresponds to Applicants' sliding film which is made of a "binder resin containing at least solid lubricant and inorganic particles" as recited in pending claim 1. [5/17/07 Office Action, p. 2]. However, Kato fails to disclose a

sliding film comprising, in addition to a binder and fluorocarbon resin, a "titanium oxide powder and a silane coupling agent" as recited in Applicants' amended claim 1. This deficiency is also recognized and asserted by the Office Action. [5/17/07 Office Action, p. 3].

Thus, Kato fails to teach, disclose, or suggest a sliding film "being made of a binder resin ... a solid lubricant, titanium oxide powder, and a silane coupling agent" as recited in Applicants' amended claim 1. Applicants submit claim 1 is patentably distinct from Kato for at least this reason. Dependent claim 3 is amended to recite a specific composition range for the titanium oxide powder and, hence, is asserted to be in condition for allowance for at least similar reasons. Accordingly, the Section 102 rejection of claims 1 and 3 should be withdrawn.

C. Claims 2 and 4-19 are Patentable over Kato in view of the Cited References

Applicants respectfully traverse the rejection of claims 2 and 4-19 under 35 U.S.C. § 103(a) as allegedly being unpatentable for obviousness over Kato, either alone or in view of Sagawa or further in view of CN1227241 A. The rejection is respectfully traversed.

At the outset, in numerous instances the Office Action cites, without support, alleged "motivations" for certain combinations or modifications. However, it is respectfully noted that such motivation must have been present in the prior art. Motivations that arise from the inventor's disclosure or later acknowledgement of others cannot be used in a rejection. Since the rejection does not cite anywhere in the prior art where such motivation comes from, it must be presumed that the alleged motivation comes from somewhere other than the prior art and use of that motivation is improper and prejudicial. For this reason alone, the obviousness rejections should be withdrawn. Notwithstanding the problems with the recited "motivation," the obviousness rejections are overcome and traversed on the merits as follows.

The Office Action contends that claims 8-11 are obvious over Kato. However, since claims 8-11 depend directly from claim 1 they are allowable for at least the same reasons as set forth with respect to claim 1 above. Claims 12-19 have been canceled without prejudice or disclaimer, rendering the Section 103 rejection of these claims as moot.

Since claim 1 has been amended to incorporate the limitations of original claims 2-4 and 6 which the Office Action has rejected for obviousness, claim 1 is further asserted to be patentably distinct for the following reason. In rejecting claims 2 and 4-6, the Office Action attempts to remedy deficiencies in Kato through the introduction of Sagawa which is directed to a thermosetting powder coating material which forms coatings with improved sliding properties and water repellency. In one aspect, Sagawa discloses a coating material formed by combining a synthetic or natural wax with a thermosetting fluororesin powder, a hardener, and a coupling agent. [Sagawa, Col. 2, lns. 8-15 and lns. 54-64].

The Office Action contends that Sagawa discloses the use of a "silane coupling agent" and addition of inorganic "titanium oxide" particles as recited in Applicants' amended claim 1. [5/17/07 Office Action, p. 3-4]. However, Sagawa fails to disclose the specific concentration ranges utilized in Applicants' sliding film wherein the content (relative to the binder resin) of the "titanium oxide powder ... is in the range between 5% by mass and 35% by mass" and of the "silane coupling agent ... is in the range between 2% by mass and 8% by mass" as recited in amended claim 1.

In fact, Sagawa does not disclose a specific amount of titanium oxide, having only indicated that it may be added as a pigment. [Sagawa, Col. 12, lns. 12-13]. Sagawa subsequently asserts that

When the amount of the coupling agent compounded in the composition of the invention is less than 0.001 weight parts,

sufficient improvement of the adhesive property is not attained. When the amount is more than 1.0 weight %, appearance of the coating layer is inferior and the impact strength of the coating layer is decreased. [Sagawa, Col. 5, lns. 17-23].

Thus, Sagawa not only fails to disclose the concentration ranges recited by Applicants, but also indicates that coupling agent concentrations exceeding 1.0 weight % result in a deterioration of the properties of the coating layer. Applicants further note that Sagawa's coating material includes a solid lubricant comprised of "0.01 to 10 weight parts of a synthetic wax or a natural wax based on 100 weight parts of the resin composition." [Sagawa, Col. 2, lns. 40-42]. In contrast, Applicants' sliding film includes polytetrafluoroethylene as a solid lubricant, the content of which is "in the range between 15% by mass and 100% by mass" relative to the binder resin. Consequently Applicants' solid lubricant is completely different in terms of both type and content.

In addition to the distinctions noted above, Applicants respectfully disagree with the Office Action and assert that it would not have been obvious to one of ordinary skill in the art at the time of the invention to combine Kato and Sagawa to obtain claim 1, as amended. Kato is directed to a thin film coating exhibiting improved wear resistance for use with a compressor piston. Kato's film includes a binder in which polytetrafluoroethylene particles are dispersed. [Kato, ¶15]. Sagawa, on the other hand, is directed to a thermosetting powder coating composition which has

... excellent weatherability, acid resistance and adhesion to substrates including stainless steel and forms coating which have the same degree of water repellency and slipping property as those of thermoplastic fluoro-resin powders. [Sagawa, Col. 2, lns. 11-15].

Typical applications for Sagawa's powder coating include the formation of non-stick surfaces on frying pans and rice cookers. [Sagawa, Col. 1, lns. 22-27]. Sagawa's film includes a fluoro-resin

and a hardener which are mixed to cause a cross-linking reaction. [Sagawa, Col. 2, lns. 38-40]. Applicants respectfully assert that the technologies of Kato and Sagawa are directed towards vastly different fields, have different purposes, and are technologically impossible to combine. As such, the benefits of the Applicants' sliding film are not taught by, nor are they obvious in light of Kato and Sagawa.

In attempting to remedy deficiencies present in Kato and Sagawa concerning the titanium oxide concentration range disclosed in original claims 6 and 7, the Office Action contends that CN1227241 discloses titanium oxide contents of 5 to 35% by mass (claim 1) and 10 to 20% by mass (claim 7) relative to the binder resin. However, not only does CN1227241 fail to disclose a silane coupling agent, but also fails to recognize the synergistic effect of combining the titanium oxide powder with a silane coupling agent. Furthermore, the coating disclosed by CN1227241 is not adapted to be utilized as a sliding film in a compressor, but rather is a general coating with improved anti-stick and abrasion properties.

Thus, Kato, Sagawa, and CN1227241 fail to teach disclose, or suggest a sliding film comprising the combination of "a binder resin which is polyimide or polyamide-imide, polytetrafluoroethylene acting as a solid lubricant, titanium oxide powder, and a silane coupling agent" wherein the content (relative to the binder resin) "of the polytetrafluoroethylene ... is in the range between 15% by mass and 100% by mass, ... of the titanium oxide powder ... is in the range between 5% by mass and 35% by mass, and ... of the silane coupling agent ... is in the range between 2% by mass and 8% by mass" as recited in Applicants' amended claim 1. Applicants submit claim 1 is patently distinct from Kato, Sagawa, and CN1227241 for at least this reason. For at least similar reasons as stated for claim 1 above and for the secondary and tertiary references failing to overcome the deficiencies of the primary reference, dependent

claims 2 and 4-11 are also asserted to be in condition for allowance. Accordingly, the Section 103 obviousness rejection is respectfully traversed

Applicants have chosen in the interest of expediting prosecution of this patent application to distinguish the cited documents from the pending claims as set forth above. These statements should not be regarded in any way as admissions that the cited documents are, in fact, prior art. Furthermore, Applicants have not specifically addressed the rejections of the dependent claims. Applicants respectfully submit that the independent claims from which they depend are in condition for allowance as set forth above. Accordingly, the dependent claims also are in condition for allowance. Applicants, however, reserve the right to address such rejections of the dependent claims in the future as appropriate.

CONCLUSION

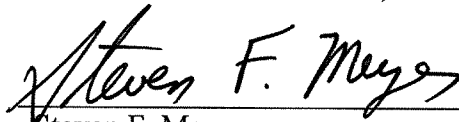
For the above-stated reasons, this application is respectfully asserted to be in condition for allowance. An early and favorable examination on the merits is earnestly solicited. In the event that a telephone conference would facilitate the examination of this application in any way, the Examiner is invited to contact the undersigned at the number provided.

THE COMMISSIONER IS HEREBY AUTHORIZED TO CHARGE ANY ADDITIONAL FEES WHICH MAY BE REQUIRED FOR THE TIMELY CONSIDERATION OF THIS AMENDMENT UNDER 37 C.F.R. §§ 1.16 AND 1.17, OR CREDIT ANY OVERPAYMENT TO DEPOSIT ACCOUNT NO. 13-4500, ORDER NO. 5000-5166.

Respectfully submitted,
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